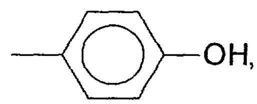
component selected from the group consisting of $C(CH_2OH)_3$, a sugar unit, and SiR_3 wherein R is a polar group selected from the group consisting of:

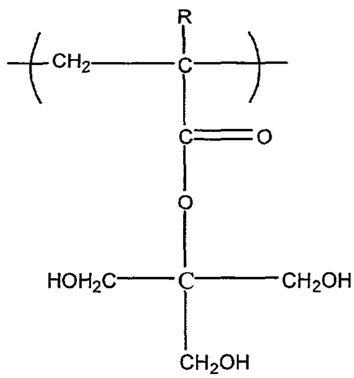
$$—CH_2CH_2CH_2OH,$$

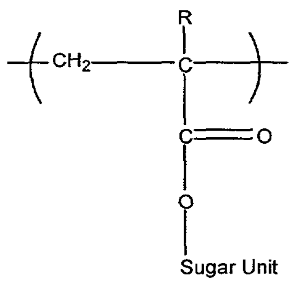


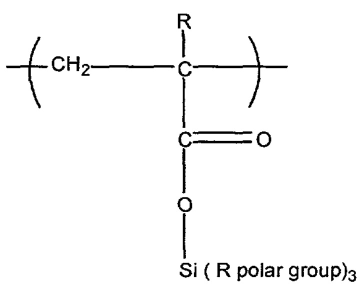
$$—CH_2CH_2CH_2\text{-}C{\equiv}N, \text{ and}$$

mixtures thereof.

One specific embodiment of a polymer that may be used as a positive tone resist is a copolymer of fluoroacrylate having the following comonomer structures:

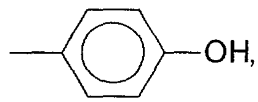






wherein R polar group is preferably selected from the group consisting of:

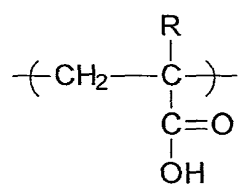
—$CH_2CH_2CH_2OH$,



—$CH_2CH_2CH_2$-C≡N, and

mixtures thereof.

In one embodiment, upon exposure to radiation, the polar group is removed from the unit, thus resulting in the formation of a carboxylic acid unit that has a higher solubility in CO_2 as illustrated by the following:



Not intending to be bound by theory, another embodiment that can allow for an increase of the polymer solubility upon exposure to radiation is to employ a polymer that is capable of undergoing chain scission upon such exposure, e.g., an alternating copolymer between a fluorinated alkyl allyl ether with sulfur dioxide. Upon exposure to radiation (e.g., e-beam), scission of the main polymer chain results and thus a lowering of the polymer molecular weight. Therefore, the resulting polymer has a higher solubility in CO_2 relative to the parent base resist of higher molecular weight.

An example an embodiment of a generic phase diagram for a positive resist is given in **FIG. 4**. Above each curve, the polymer (e.g., resin) is soluble